BRINGING BEES TO THEIR KNEES

BY TERESA MARIANI HENDRIX

IT'S A MYSTERY MAKING HEADLINES across the United States this year: What's killing America's bees?

The topic might seem arcane, until you consider that one-third of the nation's crops – and their growers – depend on honeybees for pollination and production. In California, for example, the No. 1 export crop is almonds.

Almond orchards require two active hives per acre during spring blossom. While collecting almond nectar, the bees pollinate the almond trees. No bees, no almond crop. With 600,000 acres of almonds under cultivation in California, that's a lot of bees needed – approximately a million beehives.

Just ask Cal Poly Professor Scott Jeffreys, who teaches commercial beekeeping in the Horticulture and Crop Science Department and runs the year-round Cal Poly honey student enterprise project.

The professor and his students move Cal Poly's multiple bee hives around campus throughout the year to locations such as the avocado and citrus orchards, in addition to the department's various seed crop fields.

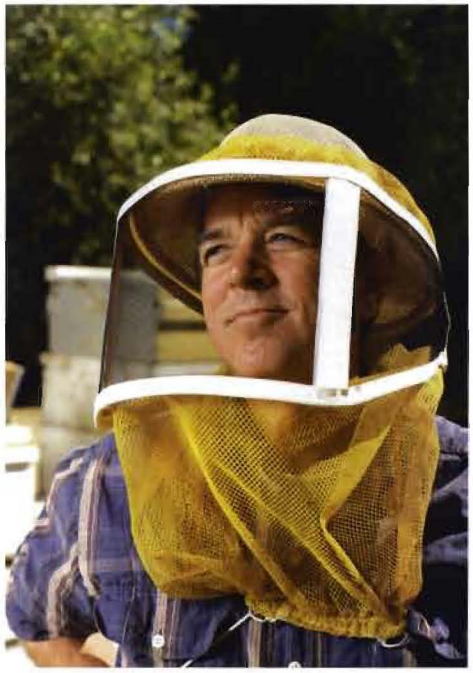
When they're not wrangling herds of insects and harvesting honey, Jeffreys and his students are working on ways to save the bees.

The commercial honeybee industry has had a one-two punch over the last several years, the professor explains, including increasing attacks by the Varroa destructor mite, a parasite that attaches to the bee's body and can vector up to 20 different honeybee viruses.

It would be like having a tick "the size of a Chihuahua" on you, according to Jeffreys.

At the same time, more hives across the nation have been hit by American Foul Brood, a bacteria with a nasty spore form

PROFESSOR, STUDENTS WORK TO SAVE THE HUMBLE HONEYBEE



that is difficult to control. Infected hives have to be burned to kill the spore.

Hives also have been hit by Colony Collapse Disorder, causing bees to flee their homes and simply disappear. There's also the emergence of the small hive beetle, which originated in Africa. It tunnels through a bee hive and turns honey into "a stinky, unusable mess," Jeffreys said.

Another factor cited as beleaguering the bees is loss of wildflower habitat, due to urban encroachment and systematic pesticide use.

Beekeepers and entomologists have known about all of these threats for the past 15 years, but it's only been in the past year that the mystery die-off – or just plain vanishing – has affected hundreds of thousands of hives and their honeybees.

"It's pretty grim," said Jeffreys, who worked in the commercial bee industry at the Kona Queen Company in Hawaii – one of the larger commercial bee operations in the United States – before coming to Cal Poly. "It's fair to say the entire commercial bee industry is on its knees."

Meanwhile, on campus, Jeffreys and his students are harvesting honey, pollinating crops with their bees, and focusing on keeping disease and parasites at bay.

They also are breeding naturally disease and mite-tolerant queen bees. The Cal Poly queens and bees have been chemical free for the past three years. They are bred and cared for without the use of antibiotics, pesticides or any other chemicals. Jeffreys is convinced that's the best survival strategy.

Honeybees bred to be tolerant of the Varroa mite will smell and detect capped larvae or pupae infected with a fertile mite. The bees then cannibalize the larvae, tossing it and the mite out of the hive, Jeffreys said.

Any extra queens not required to establish or continue Cal Poly hives could be sold to commercial beekeepers for $10-$15 each.

Though 2006 was a tough year for the Cal Poly bees, they held their own. And with the heavy rains, and resulting flowers, they found a lot of nectar. "Last year was the best honey year we've ever had," Jeffreys said. "We made seven or eight barrels of honey and we're still bottling and selling the last couple of barrels."

About 10 students work on the Cal Poly honey enterprise project every year. They do everything from harvesting to bottling.

Jeffreys has another 36 students this quarter in his fruit science commercial beekeeping class. These include agriculture business management students, some computer science students, and even the occasional mechanical engineer or graphic artist. "I think the students tell each other about the class. After one class, I tell the students they could be the hit of any dinner party," Jeffreys said with a smile.

Students have to buy their own beekeeper gloves – leather-handed with cloth forearm guards held in place with elastic over the elbow to keep the bees out. The Horticulture and Crop Science Department equips the class with commercial beekeeper helmets and veils to cover faces and necks. That's all that's needed for protective gear.

The first day of class, students head out to the hives, open them up, and learn how to spot the queen. "It's all an outdoor adventure. I tell them the only thing with more adventure is rodeo," Jeffreys said.

"You will get stung. Probably more than once," he warns. "I tell the students, 'If you're allergic to bees, you're in the wrong class.'"

Cal Poly Honey is available in season at the Campus Market. To find out about the Cal Poly beekeeping operations or Cal Poly Honey, contact Jeffreys at *sjeffrey@calpoly.edu.* □